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RESEARCH INVOLVING IMPROVEMENT OF APRICOT ASSORTMENT IN THE SOUTH AREA OF ROMANIA

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Abstract

The modern concept of culture and superintensive apricot requires a variety of plant architecture enabling small distances without diminishing opportunities for complex mechanization, unrestricted illumination of the crown, with the normal course of the application process and other photorespiration physiological and biochemical processes, reflected in the synthetic, regular and quality production. Research and character traits of each constituent of complex systems, which are known and new biological forms obtained in the improvement of apricot, require specific methods for data collecting, processing and interpretation.

INTRODUCTION

The creation of varieties with different fruit maturation periods, especially extra early and maturation, has been a priority since 1980 to improve the program in Romania.

The market demand for extra early apricots, until recently satisfied by importing them from the Mediterranean countries like Italy, France, Spain, Turkey is a strong argument for the scientists involved in the improvement of this species.

It aims to obtain new varieties with particular organoleptic qualities, resistance to diseases so stable apricot: *Monilinia laxa* (Aderh et Ruhl) Honey, *Stigmina carpophilla* (LEV) and *Cytospora cincta* Sacc and *Plum-pox* virus, better ecological plasticity, the tree for small force allow the crop intensivization of early fruit-bearing with high productive potential.

The increase in apricot production will be achieved by creating varieties able to use better environmental conditions; between these two elements is there a direct relationship.

In this context, there arises the need to establish itself strategies for achieving specific variety and technological links, to overcome current barriers: lack of adaptation to larger areas, susceptibility to diseases, frost and winter, still productive at low, alternating fructification, poor quality fruit.

MATERIAL AND METHODS

The biological material is represented by a total of 33 phenotypes of apricot and 3 control varieties with different fruit maturation periods: extra early, early, middle and late. Experimental plot with a competitive culture destination was planted in spring 1998 on an area of 1.21 hectares. The setting system is linear block, 4 repetitions in each block with 5 trees in each repetition. At the end of the row 1 tree was used as isolation. Trees were grafted in 1996 on apricot rootstock Franc (Poroschia local selection) with branch graft ELISA tested, harvested from microculture where was selected the most valuable phenotypes. After planting, the axis was shortened to 60 cm from ground level. In May in June have made cuts of crown formation. Crown shape was chosen vessel improved. Between 2 and 3 were made at planting correction angles, mechanical cultivation 3-4. Intervals between rows alternating with grass husbandry were black. During the first 3 there years were applied in furrow irrigation 3-4 and 4-5 treatments allowed organic chemicals with diseases and pests. The research methods used on this purpose were the following: observations and determinations of vegetative growth (increase in thickness of the trunk, crown volume), observations and determinations of fructification stages (early flowering, fruit ripening, the need for active temperature to browse fructification phenophases), methods of study of the factors limiting production (resistance to pests and diseases), methods for determining fruit quality (weight and size, content of ascorbic acid, acid content, the percentages of pulp and stone). Calculation of the assets above the threshold temperature of 6.5^0C was obtained biologically by adding the average temperature at the exit of obligatory rest (biological) and early December until the beginning of the end of flowering and flowering to fruit maturation. Resistance to disease was made by noting the degree of attack. Increase in thickness was calculated by multiplying the trunk diameter greater than the diameter of the trunk, resulting in the trunk section area Based on measurements made with the calliper on the three dimensions of a fruit: large diameter, small diameter and height, shape index was calculated. Shape index, synthetic data in some years may vary depending on weather conditions, particularly rainfall. When index values are as close to 1, or less than supraunitar subunit, the fruits are almost round or flat. When the result is well above 1, the fruit is elongated and can be appreciated oblong or elliptical shape.

RESULTS AND DISCUSSION

From the 33 phenotypes studied were selected the most valuable in terms of very early aging phenotypes (Valeria and Rares) and very late aging phenotypes (Adina); these results represent a high achievement for the enriching the assortment and markets for the sale of indigenous fruits, often superior to those imported in terms of taste quality.

In terms of the genetic traits specific to each variety of mature fruit sooner or later, the apricot varieties were divided into age of maturation as follows: extra early maturing varieties, early maturing varieties; middle maturing varieties, late maturing varieties.

Regarding the need for active temperature to trigger flowering phenophase was found that the differences between maturity groups are 22 and 33 degrees, which corresponds to a total of 3 days with temperatures above the biological threshold for the earliest blooming and that 5 days later for the blooming (Table 1).

For fruit ripening, the amounts are different temperatures after the aging group. Thus, extra early phenotypes need temperatures between 888-1000 degrees, the earliest between 916-1457, the middle between 1280-1874 and the late between 1584-1998. One year earlier, the number of days from bloom to ripening is between 32 days and a year later, phasing fruit maturation takes place over 43 days (Table 1).

Table 1

Amounts of active temperatures 6.5 ^{0}C above the biological phenophases at the beginning of flowering and fruit ripening

Ripening group	Flowering period (limits)	∑° until beginning of flowering - limits-	Ripening period -limits-	∑° temp. from blooming to ripening -limits-	Nr. of days from bloom to ripening
Extra early	25.03-16.04	144-317	4.06-14.06	888-1000	57-71
Early	25.03-18.04	144-334	14.06-1.07	916-457	64-100
Middle	27.03-19.04	155-350	4.07-20.07	1280-1874	79-110
Late	28.03-19.04	166-350	15.07-28.07	1584-1998	89-114

Productivity index varies in direct proportion to the amount of fruit on the tree done. While the core area values can be from one year to the next higher or stagnant production and also fluctuate downwards. It is noted that during the 3 years studied, the trees aged 4-6 years, productivity index ranged from 0.05-0.07 to extra early phenotypes between 0.06 to 0.10 on average compared with phenotypes Excelsior control of 0.06-0.07 and between 0.05 -0.08 at late phenotypes compared with Favorit control 0.03-0.09.

In our country, although there are quoted more fungi that can contribute to the decline of apricot, the highest frequency of attack are: *Monilinia laxa* (Aderh et Ruhl) Honey, *Stigmina carpophilla* (LEV) and *Cytospora cincta* Sacc., which cause significant damage in all apricot-growing areas.

Table 2

Changes in productivity index of most valuable apricot phenotypes with different maturation periods

Phenotype	Productivity index (kg/cm^2)		Sectional area of trunk (cm^2)	
	(average 3 years)	limits	(average 3 years)	limits
V1 Valeria	0.07	0.07	185.16	66.16-345.0
V2 Rares	0.06	0.05– 0.07	193.61	59.9-351.3
V3 Carmela	0.07	0.06– 0.08	213.53	70.9- 383.91
V4 Viorica	0.09	0.07– 0.10	222.76	70.8 - 415.61
Dacia - Control	0.09	0.08– 0.10	212.12	66.4-383.4
V31 Andrei	0.06	0.06– 0.07	181.85	66.3– 342.8
V17 Nicusor	0.07	0.06– 0.09	241.18	90.6– 471.6
V26 Ilinca	0.06	0.05– 0.07	252.56	105.8– 464.4
Excelsior - Control	0.07	0.06– 0.07	255.10	105.8– 478.0
V30 Adina	0.07	0.05– 0.08	256.34	109.6 – 468.1
Favorit - Control	0.05	0.03– 0.09	251.77	108.5 – 502.0

Notaries were performed in conditions of natural infection treatment plant in the background making the smallest number with organic substances allowed.

Table 3

Reaction to major diseases and Plum-pox virus, the most valuable of apricot phenotypes with different maturation periods

Phenotype	*Stigmina carpophilla* (Lev) M.B.Ellis G.A%	*Cytospora cincta* Sacc. G.A%	*Monilinia laxa* (Aderh et Ruhl) G.A%	*Plum-pox* G.A%
V1 Valeria	0.6	0	0	0
V2 Rares	0.13	0.48	0	0
V3 Carmela	0	0.18	0.8	0
V4 Viorica	0.3	0.08	0.9	0
Dacia - Control	0	0	0	0
V31 Andrei	0	0	0	0
V17 Nicusor	0	0	0	0
V26 Ilinca	0	0	0	0
Excelsior Control	0	0	0	0
V30 Adina	0	0	0	0
Favorit - Control	0	0	7,0	0

All phenotypes, except Favorit control, show degrees of attack less than 1%, which is resistant on the notaries scale (R).

Phenotypes: Valeria, Rares, Carmela, Viorica, Andrew Nicusor, Ilinca, Adina, fruit weight between 56 g (Rares) and 93 g (Viorica), shape index 0.99 (Viorica) and 1.02 (Nicusor), which corresponds to a spherical shape, flat and spherical. All these phenotypes shows large percentages of pulp (Table 4).

Tabel 4

Quality elements as the most valuable fruit of apricot phenotypes with different maturation periods

Phenotype	Average fruit weight - gr.	Shape index	% stone	% flesh
V1 Valeria	60.67	1.15	5.98	94.02
V2 Rares	56.33	1.16	6.34	93.66
V3 Carmela	89.67	1.26	4.54	95.46
V4 Viorica	93.67	0.99	4.41	95.59
Dacia - Control	78.0	1.01	4.78	95.22
V31 Andrei	75.33	1.08	5.31	94.69
V17 Nicusor	79.33	1.02	5.04	94.96
V26 Ilinca	80.67	1.1	4.96	95.04
Excelsior Control	78.67	1.11	5.34	94.66
V30 Adina	64.33	1.1	4.97	95.03
Favorit - Control	68.0	1.21	5.44	94.56

The dry matter content is high, ranging between 15.47% and 21.33% from variety Valeria to variety Viiorica. Genetic gain due to heredity and that is transgressively type of vitamin C level, which is much higher compared to conventional varieties, ranging from 13.8 mg/100 g (Ilinca) and 21 mg/100 g (Carmela). The titratable acidity level is balanced, with between 1.17 mg/100 ml (Nicusor) and 1.43 mg/100 ml (Carmela). Firmness had values between 1.14 (Valeria) and 3.07 (Andrei) (Table 5).

Tabel 5

Biochemical features and fruit firmness in the most valuable apricot phenotypes with different maturation periods

Phenotype	Solubile dry matter content %	Titrable acidity malic acid g%	Content ascorbic acid C vit. mg/%	Firmness kg force/cm^2
V1 Valeria	15.47	1.25	14.2	1.14
V2 Rares	17.27	1.25	16	1.64
V3 Carmela	20.4	1.43	21	2.11
V4 Viorica	21.33	1.39	16.67	2.43
Dacia - Control	18.47	1.14	18.33	1.8
V31 Andrei	18.13	1.19	14.13	3.07
V17 Nicusor	19.2	1.17	15.53	1.21
V26 Ilinca	18.27	1.83	13.8	2,41
Excelsior Control	19.63	1.87	16.8	1.75
V30 Adina	18.2	1.82	17.33	3.0
Favorit - Control	17.8	1.93	15.2	2.64

CONCLUSIONS

1. In terms of genetic traits specific to each variety of mature fruit sooner or later, apricot varieties were divided into ages of maturation as follows: extra early maturing varieties (4.06 -14.06), early maturing varieties (14.06-1.07), middle maturing varieties (4.07-20.07), late maturing varieties (15.07-28.07).
2. From the 33 phenotypes studied were selected the most valuable in terms of very early aging phenotypes (Valeria and Rares) and very late aging phenotypes (Adina); these results represent a high achievement for the enriching the assortment and markets for the sale of indigenous fruits, often superior to those imported in terms of taste quality.
3. They complement the assortment of varieties with different maturation periods, with particular organoleptic qualities, high productivity; they are suitable for crop intensivization (intensive crops and superintensive crops) and also they have resistance to specific diseases: *Monilinia laxa* (Aderh et Ruhl) Honey, *Stigmina carpophilla* (LEV), *Cytospora cincta* Sacc and *Plum-pox* virus.

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